

# CENTER FOR ADVANCED STRUCTURAL COMPOSITES

## CENTER

The Center for Advanced Structural Composites was first funded in 1998 to develop the commercial potential of fibre reinforced composites by improving the strength, stiffness, damping, and acoustical performance of structures manufactured using advanced composite materials.

## TECHNOLOGY

The core technologies consist of a damping enhanced wavy composite material system, and an ultra-lightweight composite structural shape known as the "IsoTruss". The wavy composite material utilizes carbon fibers layered in sinusoidal patterns on laminated material to enhance acoustic damping characteristics without compromising strength or stiffness. The IsoTruss structure is made of carbonfibres wound in a complex geometric pattern and stabilized through an epoxy cure cycle. The resulting lightweight structure exhibits extreme rigidity and torsional strength. The technology has the potential for various functional applications including aerospace, automotive, support towers, heavy construction support members, and preformed concrete beams.

## ACCOMPLISHMENTS

Last year, a new business, Patterned Fibre Composites, Inc., was established with license rights to produce products using the damped wavy composite technology. The company was awarded a \$950,000 Phase II SBIR contract from the USAF to commercialize the technology. With the licensing of this technology, the Centers' focus was moved primarily to the IsoTruss technology. Significant analysis work was completed on the 6 node IsoTruss configuration and one patent was issued. Additional configuration designs are underway with additional patents being prepared for filing. Industrial interest in the IsoTruss continues to be high and prototype designs are being evaluated. Contemplated applications include lightweight bicycle frames, freeway sign supports, tilt-up wall braces for construction, and powerline support towers.

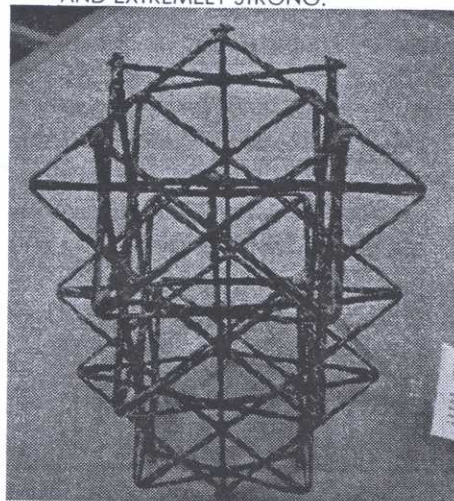
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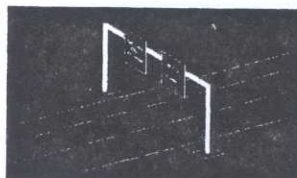
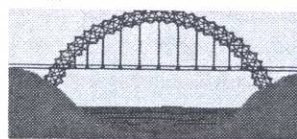
*Can You Imagine...*

... a powerline transmission tower that can withstand extreme wind conditions, support tremendously heavy loads, is corrosion free, is unaffected by temperature extremes, and weighs significantly less than conventional steel towers.

THE CENTER DEVELOPS FIBRE  
REINFORCED COMPOSITE MATERIALS  
AND STRUCTURAL DESIGNS THAT ARE  
LIGHTWEIGHT, STRUCTURALLY RIGID,  
AND EXTREMELY STRONG.



An example of the IsoTruss structure that provides extreme rigidity and torsional strength in a very lightweight configuration.



Some anticipated applications for the IsoTruss technology.